[Name of Document] Claims

[Claim 1]

An automatic focusing control apparatus having a focusing lens and an image pickup sensor, comprising:

an image pickup section configured to pick up an image of a subject in synchronization with the cycle of an image vertical synchronizing signal in a cycle which is one-Nth (N being an integer) of the cycle of the image vertical synchronizing signal;

a calculation section configured to calculate a focus evaluation value for performing automatic focusing based on an image pickup signal picked up by said image pickup section;

a changing section configured to change the distance between said focusing lens and said image pickup sensor based on the focus evaluation value calculated by said calculation section; and

a synthesis section configured to synthesize a plurality of image pickup signals picked up by said image pickup section, wherein

the cycle of the image vertical synchronizing signal and N times (N being an integer) the cycle in which the focus evaluation value is calculated by said calculation section are synchronized with each other, and

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A times (A being an integer) the cycle of the image vertical synchronizing signal and B times (B being an integer) the cycle in which the distance is changed by said changing section are synchronized with each other where the integer A and the integer B satisfy a relationship of B > A.

[Claim 2]

The automatic focusing control apparatus as set forth in claim 1, wherein

said calculation section calculates the focus evaluation value based on a high-frequency component of a luminance signal of the image pickup signal.

[Claim 3]

The automatic focusing control apparatus as set forth in claim 1, wherein

said synthesis section synthesizes image pickup signals determined in advance from among the plural image pickup signals picked up by said image pickup section.

[Claim 4]

An automatic focusing control method for an automatic focusing control apparatus having a focusing lens and an image pickup sensor, comprising:

an image pickup step of picking up an image of a subject in synchronization with the cycle of an image

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vertical synchronizing signal in a cycle which is one-Nth (N being an integer) of the cycle of the image vertical synchronizing signal;

a calculation step of calculating a focus evaluation value for performing automatic focusing based on an image pickup signal picked up by the process at the image pickup step;

a changing step of changing the distance between said focusing lens and said image pickup sensor based on the focus evaluation value calculated by the process at the calculation step; and

a synthesis step of synthesizing a plurality of image pickup signals picked up by the process at the image pickup step, wherein

the cycle of the image vertical synchronizing signal and N times (N being an integer) the cycle in which the focus evaluation value is calculated by the process at the calculation step are synchronized with each other, and

A times (A being an integer) the cycle of the image vertical synchronizing signal and B times (B being an integer) the cycle in which the distance is changed by the process at the changing step are synchronized with each other where the integer A and the integer B satisfy

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a relationship of B > A.

[Claim 5]

A recording medium on or in which a computer-readable program for an automatic focusing control process for an automatic focusing control apparatus having a focusing lens and an image pickup sensor is recorded, the program comprising:

an image pickup step of picking up an image of a subject in synchronization with the cycle of an image vertical synchronizing signal in a cycle which is one-Nth (N being an integer) of the cycle of the image vertical synchronizing signal;

a calculation step of calculating a focus evaluation value for performing automatic focusing based on an image pickup signal picked up by the process at the image pickup step;

a changing step of changing the distance between said focusing lens and said image pickup sensor based on the focus evaluation value calculated by the process at the calculation step; and

a synthesis step of synthesizing a plurality of image pickup signals picked up by the process at the image pickup step, wherein

the cycle of the image vertical synchronizing

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signal and N times (N being an integer) the cycle in which the focus evaluation value is calculated by the process at the calculation step are synchronized with each other, and

A times (A being an integer) the cycle of the image vertical synchronizing signal and B times (B being an integer) the cycle in which the distance is changed by said changing section are synchronized with each other where the integer A and the integer B satisfy a relationship of B > A.

[Claim 6]

A program configured to cause a computer to perform an automatic focusing control process for an automatic focusing control apparatus having a focusing lens and an image pickup sensor, said program causing the computer to execute:

an image pickup step of picking up an image of a subject in synchronization with the cycle of an image vertical synchronizing signal in a cycle which is one-Nth (N being an integer) of the cycle of the image vertical synchronizing signal;

a calculation step of calculating a focus evaluation value for performing automatic focusing based on an image pickup signal picked up by the process at the

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image pickup step;

a changing step of changing the distance between said focusing lens and said image pickup sensor based on the focus evaluation value calculated by the process at the calculation step; and

a synthesis step of synthesizing a plurality of image pickup signals picked up by the process at the image pickup step, wherein

the cycle of the image vertical synchronizing signal and N times (N being an integer) the cycle in which the focus evaluation value is calculated by the process at the calculation step are synchronized with each other, and

A times (A being an integer) the cycle of the image vertical synchronizing signal and B times (B being an integer) the cycle in which the distance is changed by said changing section are synchronized with each other where the integer A and the integer B satisfy a relationship of B > A.

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